



GEO Disaster Risk Reduction Working Group

Geospatial World Forum 2022

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www.earthobservations.org
www.geoportal.org

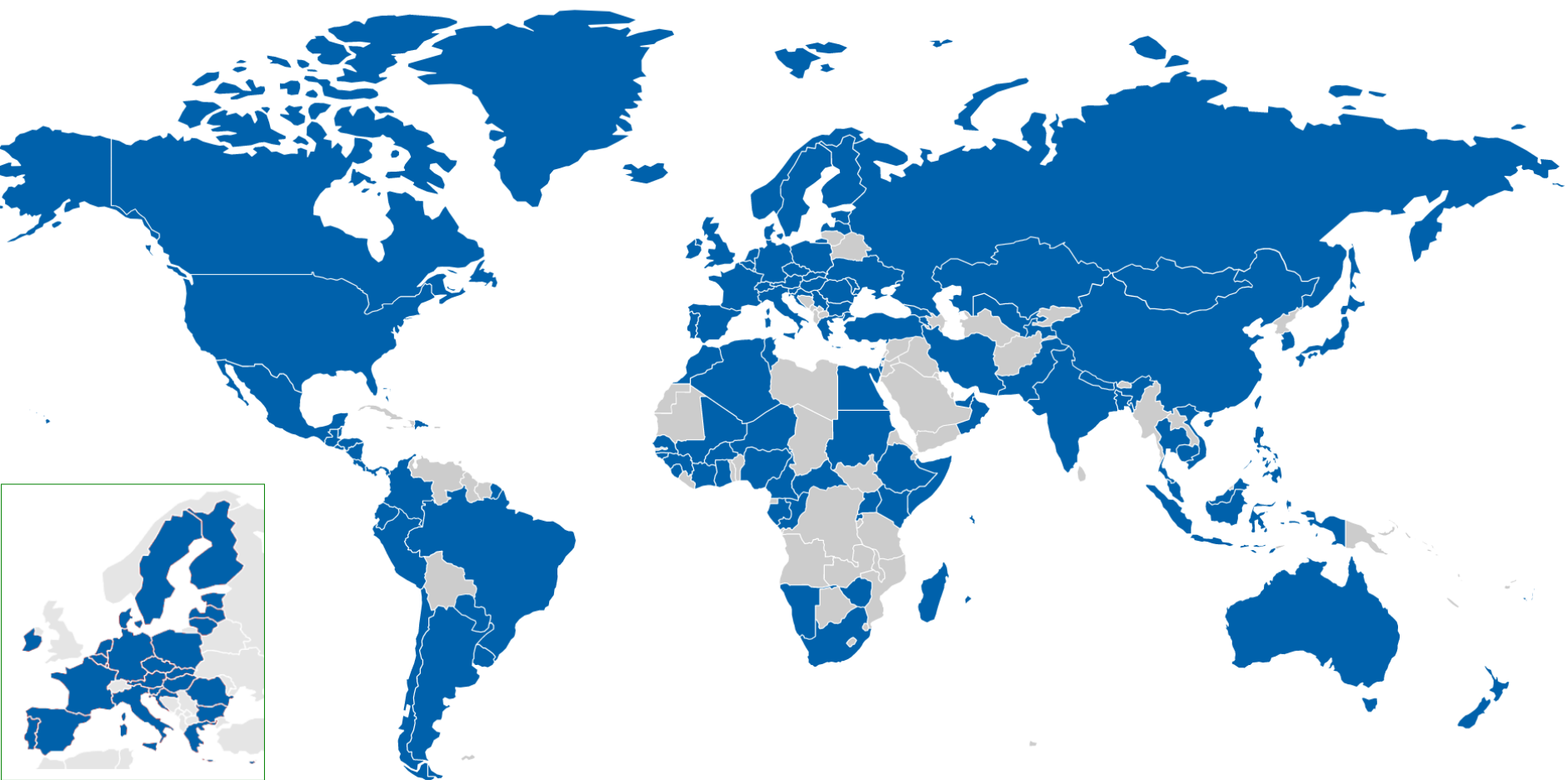
Group on Earth Observations (GEO)

GEO is an international partnership of more than 100 national governments, 100 Participating Organizations and multiple Associate members working towards a future where decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations.



About us

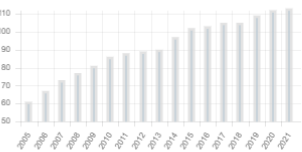
GEO Member Map for the year 2021
(Use slider under the map to change the year)



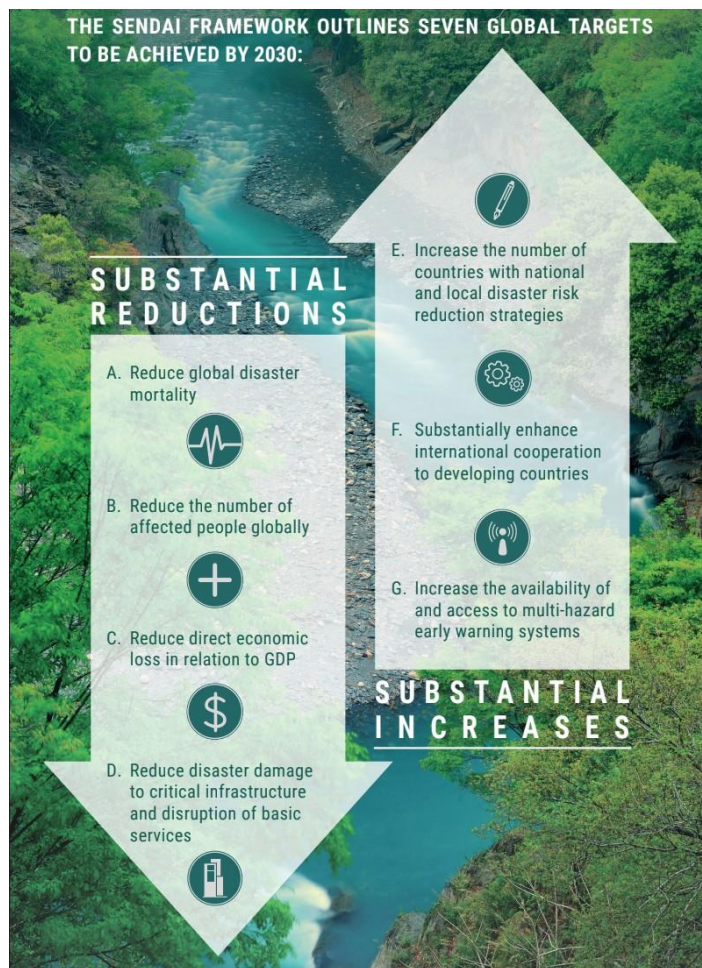
Number of Members (2021)

| | |
|---------------|-----|
| Africa: | 30 |
| Americas: | 20 |
| Asia/Oceania: | 22 |
| C.I.S.: | 6 |
| Europe: | 35 |
| Total: | 113 |

Number of Members by year



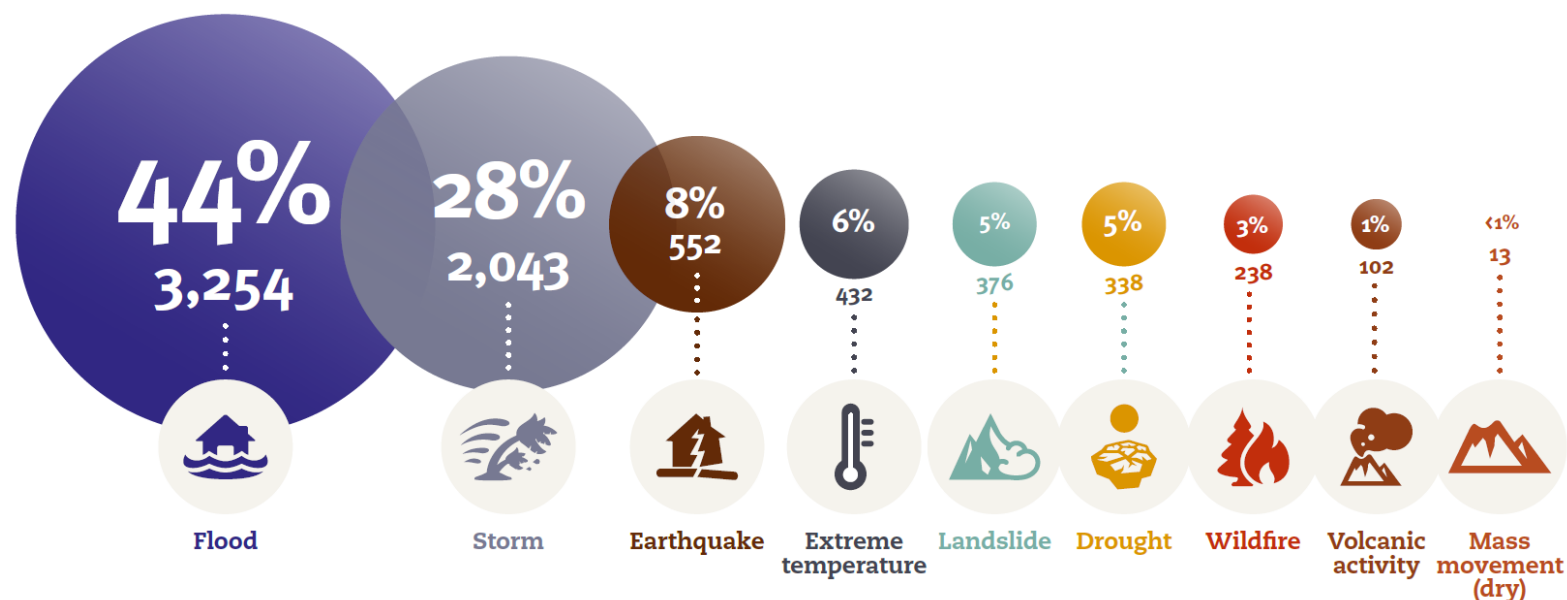
UNDRR Sendai Framework for Disaster Risk Reduction 2015-2030



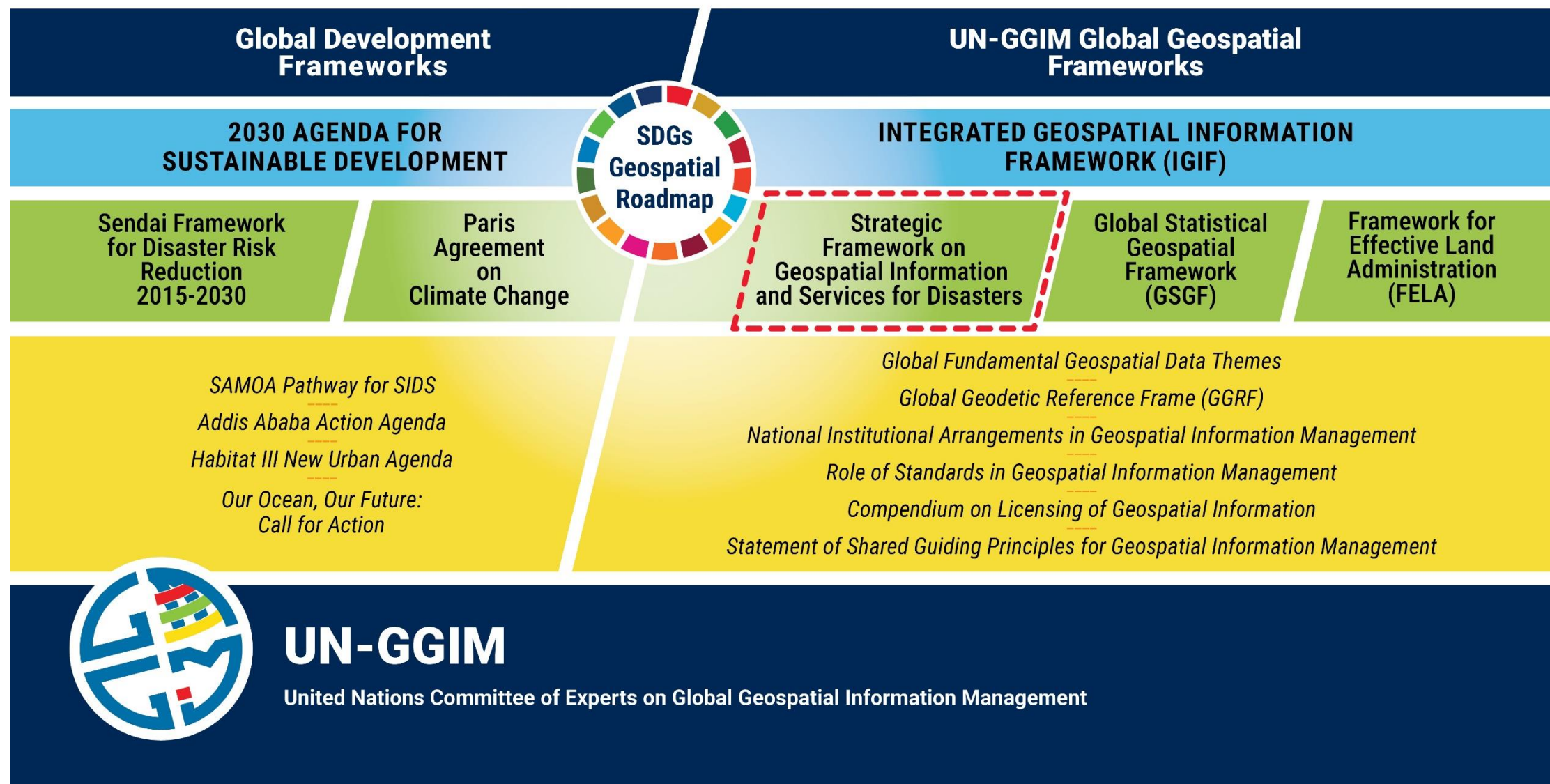
Promote and increase use of Earth observations to address disaster risk reduction efforts and achieve Global Targets.



Percentage of occurrences of disasters by disaster type (2000-2019)



UN-GGIM Strategic Framework on Geospatial Information and Services for Disasters



2020 – 2022 GEO Work Programme

GEO Flagships

| | | | |
|--------------------------------------|------------------------------------|--------------------------------------|---------------------------------------|
| GEO Biodiversity Observation Network | GEO Global Agricultural Monitoring | Global Forest Observation Initiative | Global Observation System for Mercury |
| GEO BON | GEOGLAM | GFOI | GOS4M |

GEO Initiatives

| | | | | | |
|----------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------|----------------------------------------------------------|
| AquaWatch | Data Access for Risk Management | Data Integration and Analysis System | Earth Observations for Ecosystem Accounting | Earth Observations for Health | Earth Observations for the Sustainable Development Goals |
| AQUAWATCH | GEO-DARMA | DIAS | EO4EA | EO4HEALTH | EO4SDG |
| GEO Capacity Building in North Africa, Middle East, Balkans and Black Sea Region | GEO Global Water Sustainability | GEO Human Planet | GEO Land Degradation Neutrality | GEO Vision for Energy | GEO Wetlands |
| GEO-CRADLE | GEOGLOWS | HUMAN-PLANET | GEO-LDN | GEO-VENER | GEO-WETLANDS |
| Geohazard Superites and Natural Laboratories | Global Drought Information System | Global Network for Observations and Information in Mountain Environments | Global Observation System for Persistent Organic Pollutants | Global Urban Observation and Information | Global Wildfire Information System |
| GSNL | GDIS | GEO-MOUNTAINS | GOS4POPS | GUOI | GWIS |
| Oceans and Society: Blue Planet | | | | | |
| BLUE-PLANET | | | | | |

GEO Community Activities

| | | | | | |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| Advancing Communication Infrastructure and Services | Arctic GEOSS | Chinese High-resolution Satellite Data Resources | Climate Observation, Simulation and Impacts | Copernicus Atmosphere Monitoring Service | Copernicus Climate Change Service |
| ACIS | ARCTIC-GEOSS | CSDR | CLIMATE-OBS | CAMS | C3S |
| Digital Earth Africa | Earth Observation and Copernicus in support of Sendai Monitoring | Earth Observation Industrial Innovation Platform for Sustainable Development | Earth Observations for Disaster Risk Management | Earth Observations for Managing Mineral and Non-Renewable Energy Resources | Earth Observations for the Atlantic Region |
| DE-AFRICA | EO4SENDAI-MONITORING | EO-IIP | EO4DRM | EO4MIN | ATLANTIC-EO |
| Earth Observations for the Water-Energy-Food Nexus | Enhancing Food Security in African Agricultural Systems with the Support of Remote Sensing | GEO Citizen Science | GEO Essential Variables | GEO Global Ecosystems | Geodesy for the Sendai Framework |
| EO4WEF | AFRICULTURES | GEO-CITSCI | GEO-EV | GEO-ECO | GEODESY4SENDAI |
| Global Agricultural Drought Monitoring | Global Crop Pest and Disease Habitat Monitoring and Risk Forecasting | Global Ecosystems and Environment Observation Analysis Research Cooperation | Global Flood Awareness System | Global Flood Risk Monitoring | Global Land Cover |
| AGRI-DROUGHT | CROP-PEST-MONITORING | GEOARC | GLOFAS | GFRM | LAND-COVER |
| Global Observation of Deltas and Estuaries | In-Situ Observations and Applications for Ecosystem Status of China and Central Asia | Multi-source Synergized Quantitative Remote Sensing Products and Services | Next Generation Earth Observation Services | Night-Time Light Remote Sensing for Sustainable Development Goals | Open Earth Alliance |
| DELTA-ESTUARY | IN-SITU-ESC | MUSYQ | NEXT-EOS | NIGHT-LIGHT | OEA |
| Space and Security | Space Climate Observatory | The International Grand Global Ensemble | Understanding the Impacts and Value of Earth Observations | | |
| SPACE-SECURITY | SCO | TIGGE | GEO-VALUE | | |

Regional GEOs

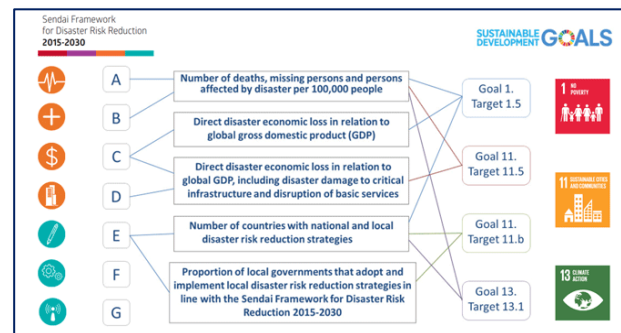
| | | | |
|-------------------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| African Group on Earth Observations | Americas Group on Earth Observations | Asia-Oceania Group on Earth Observations | European Group on Earth Observations |
| AFRIGEO | AMERIGEO | AOGEO | EUROGEO |

Foundational Tasks

| | | | | |
|----------------------------------------|-------------------------------------------------|----------------------------------|----------------------------|----------------------------|
| GEO Engagement Priorities Coordination | GEOSS Data, Information and Knowledge Resources | GEOSS Infrastructure Development | GEO Work Programme Support | GEO Secretariat Operations |
|----------------------------------------|-------------------------------------------------|----------------------------------|----------------------------|----------------------------|

GEO Disaster Risk Reduction WG

- Purpose
 - Develop and implement a coherent and crosscutting approach within GEO to advance the use of Earth observations in support of countries' disaster risk reduction and resilience efforts.
- Serve as primary GEO liaison to UNDRR
 - Promote the dissemination and use of Earth observations to strengthen capabilities to reduce disaster risk according to the needs of countries as identified by UNDRR
- Determine links and actionable opportunities between disaster risk reduction, climate change, SDGs and urban activities
- Promote awareness of relevant global policy frameworks across the WP, such as ***UN-GGIM WG-Disasters Strategic Framework on Geospatial Information and Services for Disasters***





GEO DRR WG Governance

GEO SEC: Rui Kotani, GEO SEC DRR Coordinator
Delali Kemeh, DRR Consultant

Subgroup 1: Coordination across the GEO Work Programme

Co-Chair: David Borges (NASA, United States)

Deputy Chairs: Godstime James (Africa), Fernando Belda (Spain),
Tatiya Chuentragun (Thailand)

Subgroup 2: UNDRR Coordination (Sendai Framework Monitoring & Global Assessments)

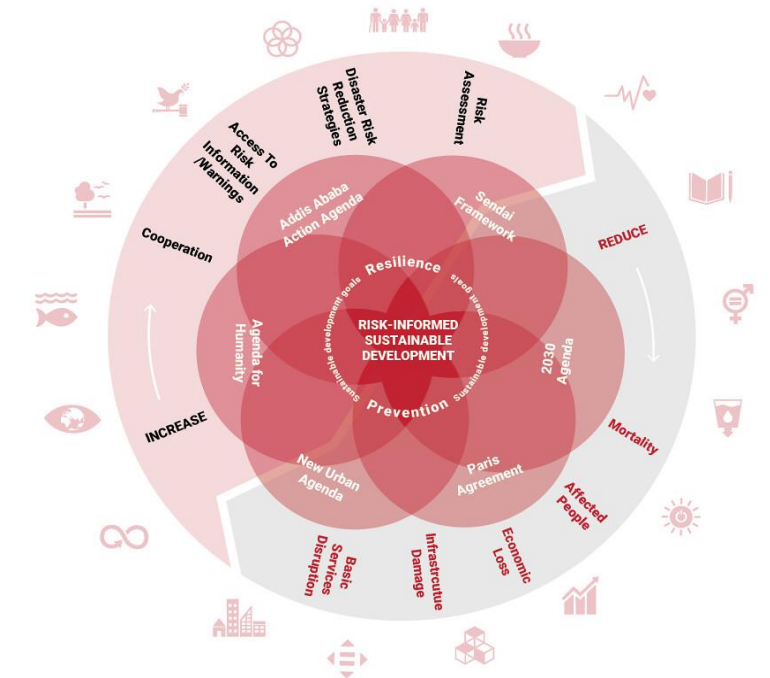
Co-Chair: Nathaniel Newlands (Agriculture/Statistics Canada)

Deputy Chairs: John LaBrecque (United States), Aliyu Abdullahi (Africa)

Subgroup 3: Climate Change, SDG, Urban Activities Coordination

Co-Chair: Kene Onukwube (DEAR Africa, Nigeria)

Deputy Chairs: Cheila Cullen (United States), Ramesh Singh (United States), Chulam Rhasul (Nepal)



DRR WG Subgroup 1 Work Plan Highlights

- Purpose
 - Develop and implement a coherent and crosscutting approach within GEO to advance the use of Earth observations in support of countries' disaster risk reduction and resilience efforts.
- Highlight aspects of the Work Programme that are DRR related, and describe key elements and locations of each activity.
- Promote, including through good practices and impact, sharing of data and knowledge to improve DRR.
- Work with SG2 and SG3 to understand real requirements at national levels and communicate these requirements to relevant activities within GEO WP.
- Promote awareness of relevant global policy frameworks across the WP, such as *UN-GGIM WG-Disasters Strategic Framework on Geospatial Information and Services*.

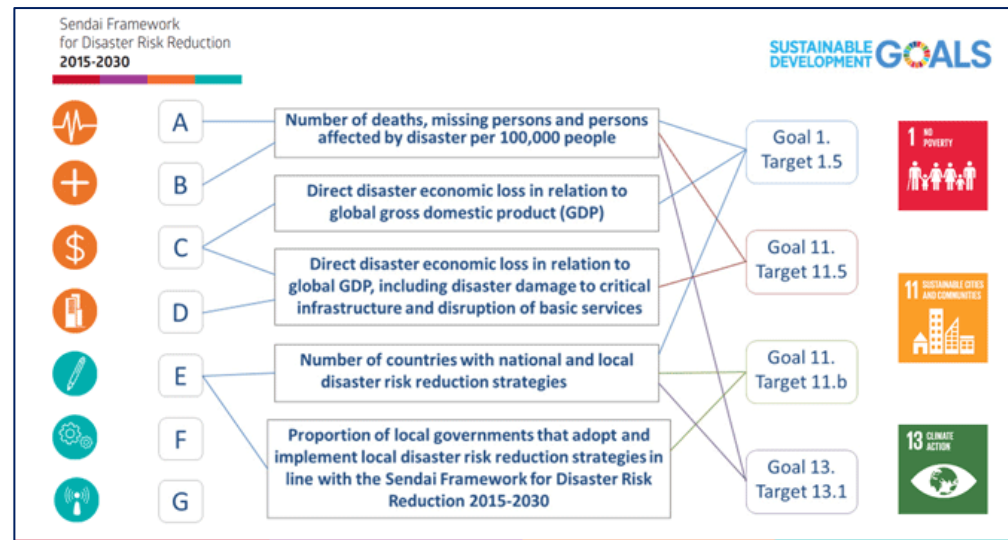
DRR WG Subgroup 2 Work Plan Highlights

- Purpose
 - Leverage SG1 efforts and use combined resources of SG2 to promote the dissemination and use of Earth observations to strengthen capabilities to reduce disaster risk according to the needs of countries as identified by UNDRR.
- Serve as primary GEO liaison to UNDRR
- Increase the use of Earth observation data for achieving the Sendai Framework's Global Target E, that is to substantially increase number of countries with national and local disaster risk reduction strategies.
- Showcase how Earth observation data can complement data governments already have to assess risk and risk trends over time.
- Showcase how Earth observations can be used to describe and visualize vulnerability and exposure.



DRR WG Subgroup 3 Work Plan Highlights

- Purpose
 - Leverage SG1 efforts to provide an overview of links, and actionable opportunities, between disaster risk reduction, climate change, SDGs and urban activities.
- Serve as primary link to Climate WG, SDG and Urban related activities.
- Document an end-to-end approach of the impacts and linkages of climate change on disaster risk reduction and the SDGs.



Activities Underway

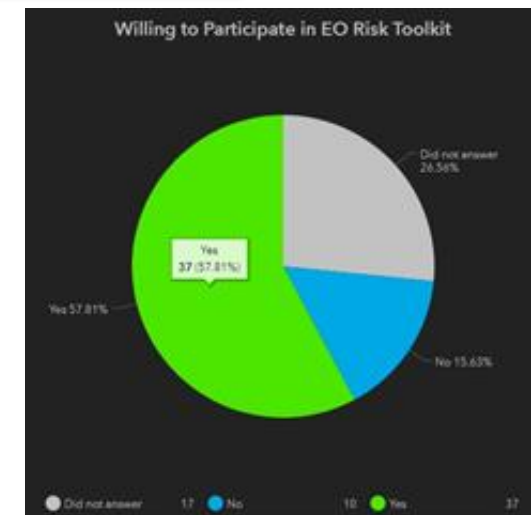
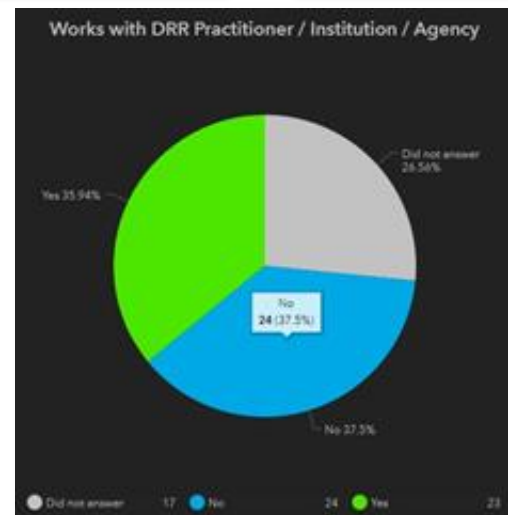
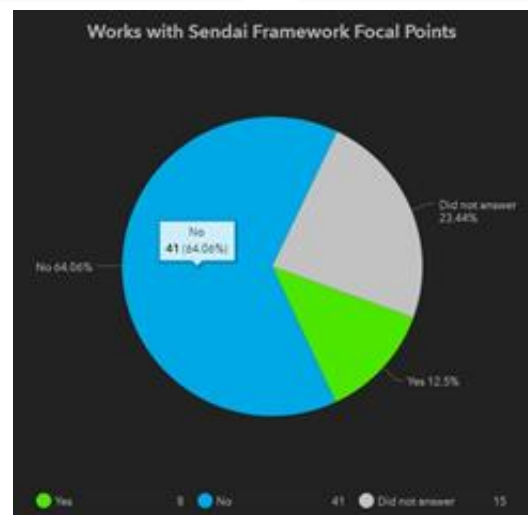
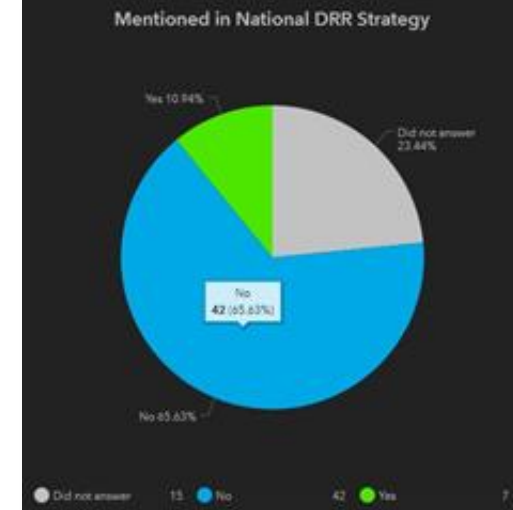
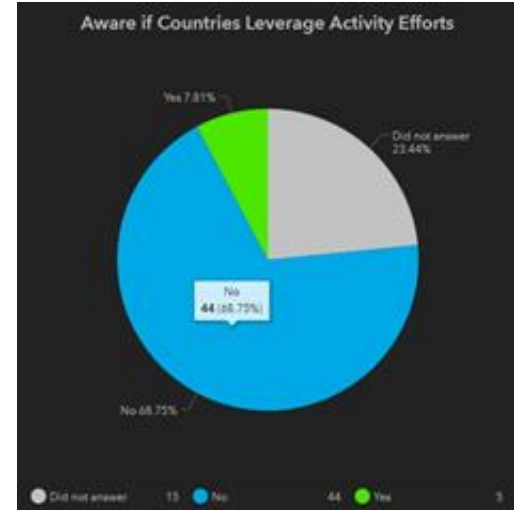
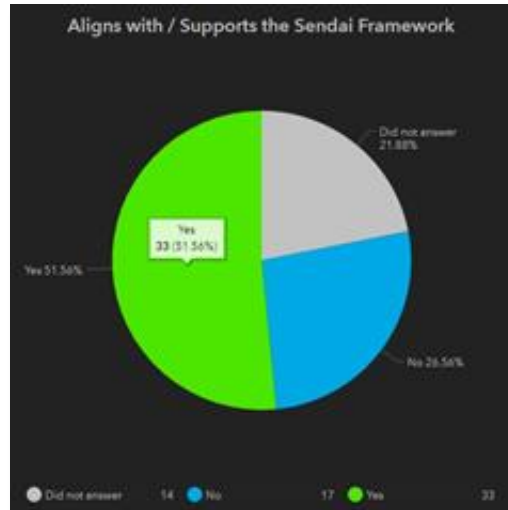


Review of current Earth observation data usage in DRR strategies by national level GEO members, in coordination with UNDRR. Develop assessment incorporating findings with status of GEO members actively working towards Sendai Target E to inform how GEO should promote and support increasing usage of Earth observations in national DRR strategies

- UN Global Assessment Report on Disaster Risk Reduction (GAR) 2022 Contributing Paper
 - *Earth Observations into Action: Systemic Integration of Earth Observation Applications into National Risk Reduction Decision Structures*

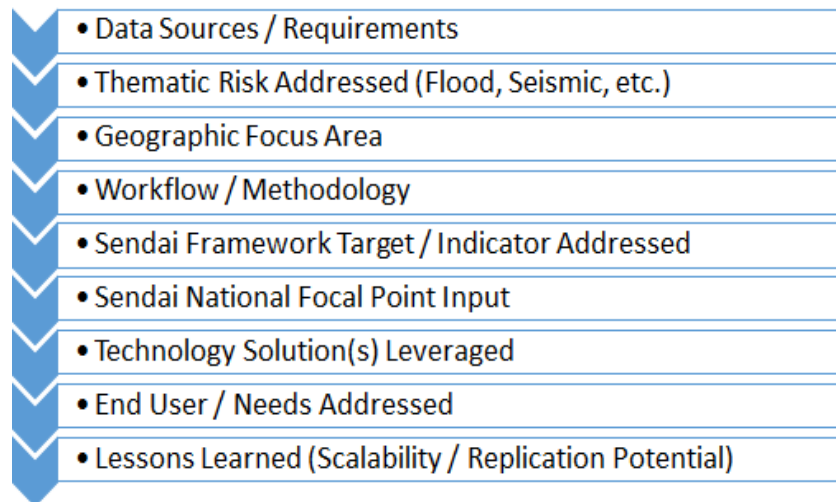
Our Engagement Priorities

GEO's global priorities include the Sustainable Development Goals, Climate Action, and Disaster Risk Reduction.

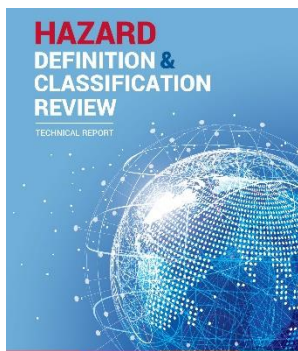
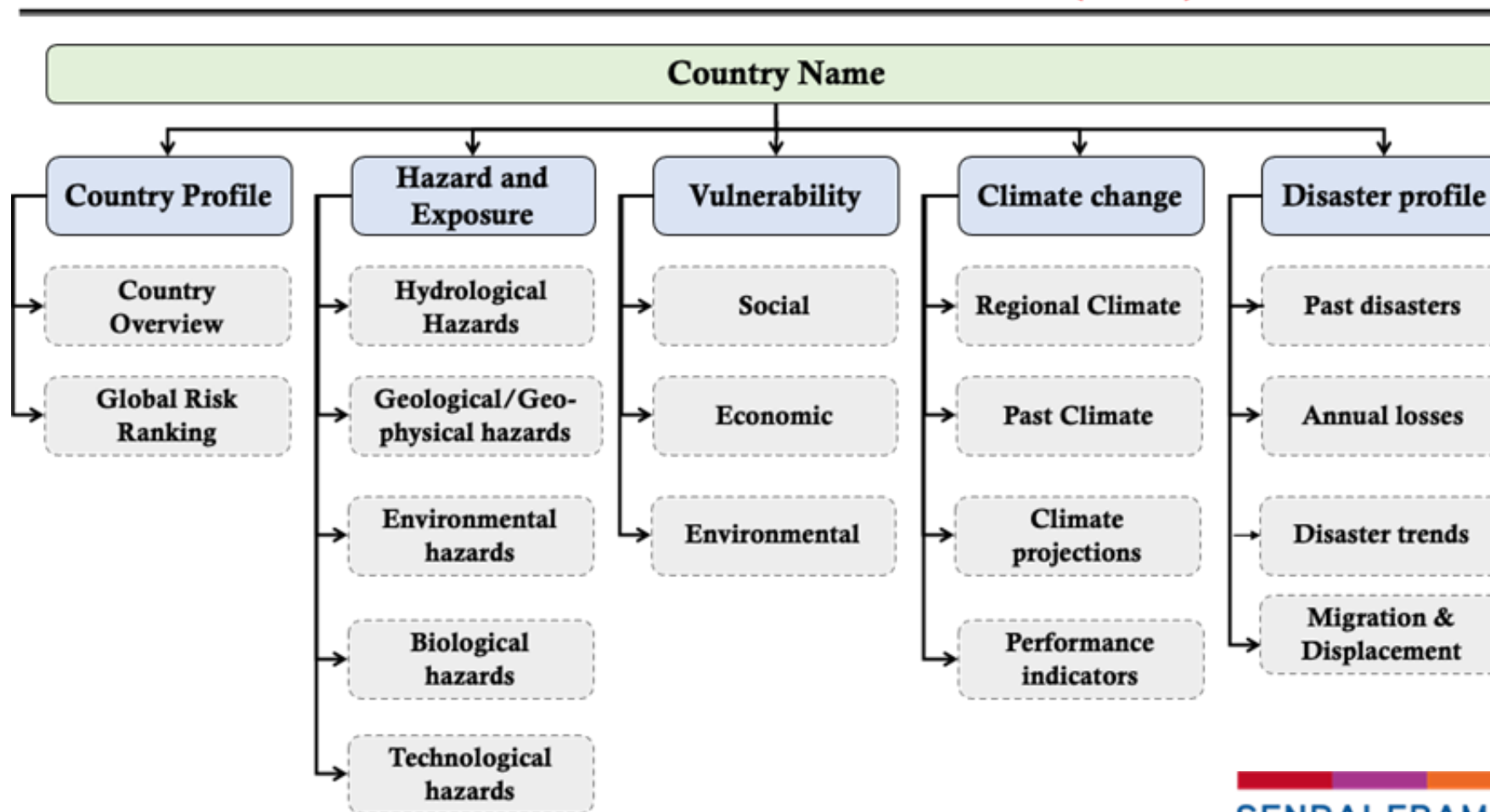


Activities Underway

- Earth Observation (EO) Risk Toolkit
 - In development with GEO DRR WG, Esri, UNDRR
 - Earth observation-informed insights are needed to support evidence-based decision making
 - Toolkit will bring together relevant use cases and tools with the goal of accelerating the uptake of EO capabilities by countries and other global disaster risk reduction organizations



GRAF National Risk Information Portal (NRIP)



EARTH OBSERVATION RISK TOOLKIT

USE CASES TOOLS POLICY BRIEFS GRAF ABOUT CONTRIBUTE

Leveraging Earth observation insights to support evidence-based decision making.

Hazards

Vulnerability

Exposure

KEY CONTENT



Use Cases



Tools



Policy Briefs

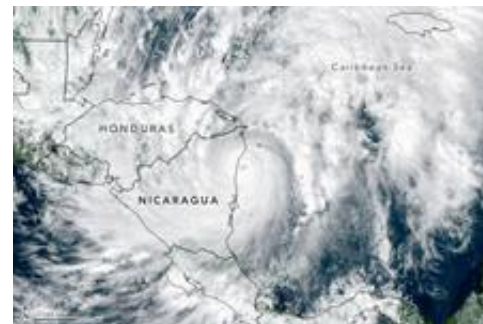


EO Data

HIGHLIGHTS

Use Case: GEOGloWS ECMWF Streamflow Forecast Service helped Honduras' state-owned company with reservoir management between two major hurricanes.

[Read More >>](#)



Use Case Example: GEOGloWS Initiative

Summary

In 2020, the National Electric Energy Company (Empresa Nacional de Energía Eléctrica: ENEE) of Honduras used a precipitation/flood forecasting EO tool to reduce loss and damage in the Sula Valley by making controlled water discharges from a reservoir between two major hurricanes, which occurred within 2 weeks: Hurricane Eta, category 4 on 2 November 2020, and Hurricane Iota, Category 5 on 16 November 2020. The EO-based analysis was also shared with the country's National DRR agencies, who made their decisions on community evacuations.

Stakeholder Impact

The damage to Sula Valley was considerably reduced by the decisions made by ENEE based on its EO enhanced analysis. The valley is Honduras' most vulnerable area because it receives water discharges from 4 rivers with draining areas of over 22,000 square kilometers; meanwhile, it is home to approximately 2 million people and produces about 65% of the national GDP. Compared to the estimated economic losses caused by Hurricane Mitch (Category 5) in 1998 (US \$3,793.6 million), combined losses of Hurricanes Eta and Iota (US \$2,171 million) were reduced by 40%.

Methodology

The EO tool used in Honduras is called the Global Water Sustainability (GEOGloWS) European Centre for Medium-range Weather Forecasts (ECMWF) Streamflow Forecast service. It is a worldwide application to forecast:

1. the overland water runoff -- water that flows over land as surface water instead of being absorbed into groundwater or evaporating; and
2. river discharge -- the volume of water flowing through a river channel; measured at any given point in cubic metres per second).

The GEOGloWS ECMWF Stream Forecast service provides an ensemble of 15-day forecasts together with 40-year historical simulations on an open website.



San Pedro de Sula Airport after Hurricane IOTA.
(Photo by Orlando SIERRA / AFP)



GEOGloWS ECMWF Streamflow Service.

Read More >>

mwf.int/

For more information, visit the GEOGloWS ECMWF Streamflow Forecast Service website

Contact



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NASA Applied Sciences Disasters Program

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www.earthobservations.org

<https://appliedsciences.nasa.gov/what-we-do/disasters>